Nonparametric extreme conditional expectile estimation

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Expectiles and quantiles can both be defined as the solution of minimization problems. Contrary to quantiles though, expectiles are determined by tail expectations rather than tail probabilities, and define a coherent risk measure. For these two reasons in particular, expectiles have recently started to be considered as serious candidates to become standard tools in actuarial and financial risk management. However, expectiles and their sample versions do not benefit from a simple explicit form, making their analysis significantly harder than that of quantiles and order statistics. This difficulty is compounded when one wishes to integrate auxiliary information about the phenomenon of interest through a finite-dimensional covariate, in which case the problem becomes the estimation of conditional expectiles. In this talk, we propose nonparametric estimators of extreme conditional expectiles based on kernel smoothing techniques. We analyze the asymptotic properties of our estimators in the context of conditional heavy-tailed distributions. Applications to simulated and real data are provided.

References

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